

# Installer's Guide

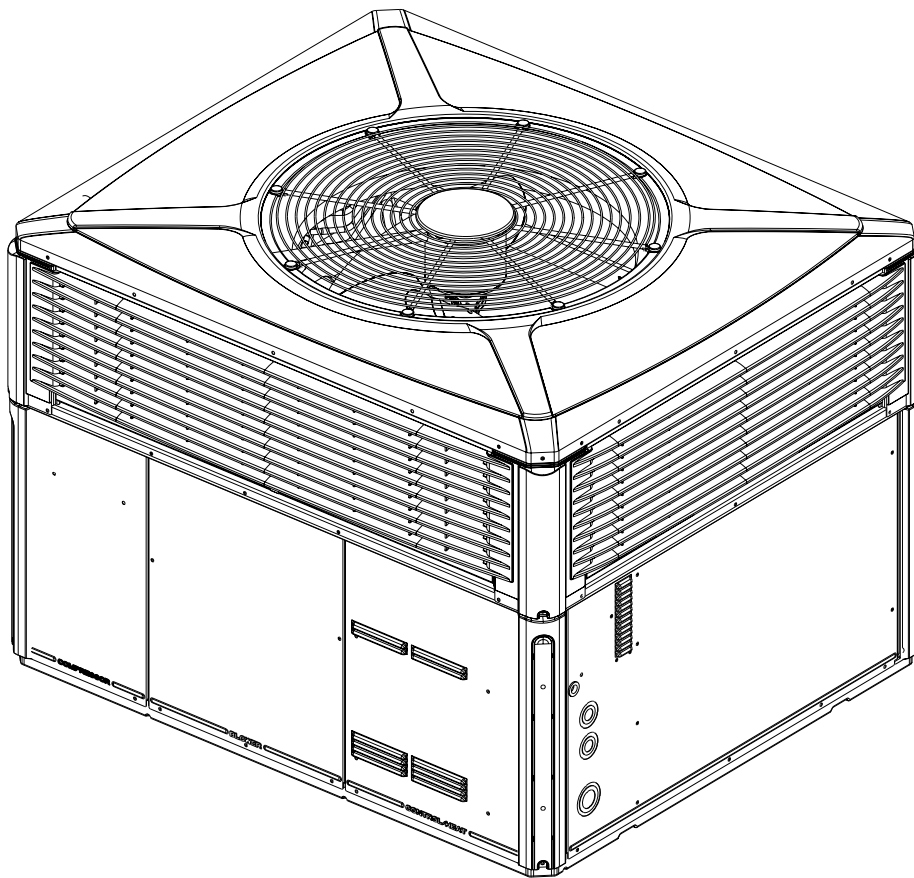
18-BB35-D1-3

4WCZ6-IG-3

## Single Package Heat Pump 16 SEER, Two Stage, Convertible 3, 4, & 5 Ton, R-410A

**ALL phases of this installation must comply with NATIONAL, STATE AND LOCAL CODES**

**IMPORTANT** — This Document is customer property. Please return to service information pack and give this Installer's Guide to the homeowner upon completion of work.



4WCZ6036A through 4WCZ6060A

**⚠ WARNING: HAZARDOUS VOLTAGE - DISCONNECT POWER and DISCHARGE CAPACITORS BEFORE SERVICING**

# Installer's Guide

## Safety Considerations

**IMPORTANT:** Read this entire manual before beginning installation procedures.

Read this manual carefully before attempting to install, operate, or perform maintenance on this unit. Installation and maintenance should be performed by qualified service technicians only.

**NOTE:** "Warnings" and "Cautions" appear at appropriate places in this manual. Your personal safety and the proper operation of this air conditioning product require that you follow them carefully. The manufacturer assumes no liability for installations or servicing performed by unqualified personnel.

### NOTICE

Warning and Cautions appear at appropriate locations throughout this guide. Read these carefully.

**⚠ WARNING:** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**⚠ CAUTION:** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices and where property-damage-only accidents could occur.

### ⚠ WARNING

#### SAFETY HAZARD!

This information is for use by individuals having adequate backgrounds of electrical and mechanical experience. Any attempt to repair a central air conditioning product may result in personal injury and/or property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

### ⚠ WARNING

#### SAFETY HAZARD!

Bodily injury can result from high voltage electrical components, fast moving fans, and combustible gas. For protection from these inherent hazards during installation and service, the electrical supply must be disconnected and the main gas valve must be turned off. If operating checks must be performed with the unit operating, it is the technicians responsibility to recognize these hazards and proceed safely.

### ⚠ WARNING

#### SAFETY HAZARD!

Do not operate the unit without the evaporator fan or coil access panels in place. Reinstall the access panels after performing maintenance procedures on the fan. Operating the unit without the access panels properly installed may result in severe personal injury or death.

### ⚠ CAUTION

#### CONTAINS REFRIGERANT!

**SYSTEM CONTAINS OIL AND REFRIGERANT UNDER HIGH PRESSURE. RECOVER REFRIGERANT TO RELIEVE PRESSURE BEFORE OPENING SYSTEM.** Failure to follow proper procedures can result in personal illness or injury or severe equipment damage.

### ⚠ CAUTION

#### RECONNECT ALL GROUNDING DEVICES.

All parts of this product that are capable of conducting electrical current are grounded. If grounding wires, screws, straps, clips, nuts, or washers used to complete a path to ground are removed for service, they must be returned to their original position and properly fastened.

### ⚠ CAUTION

#### Unit contains R-410A Refrigerant!

R-410A operating pressure exceeds the limit of R-22. Proper service equipment is required. Failure to use proper service tools may result in equipment damage or personal injury.

#### SERVICE

Use only R-410A Refrigerant and approved POE compressor oil.

### ⚠ CAUTION

#### Hot Surface!

Do Not touch top of compressor. May cause minor to severe burning.

### ⚠ CAUTION

Caution must be taken at all times to avoid personal injuries and/or damage to equipment.

**IMPORTANT:** This product has been designed and manufactured to meet ENERGY STAR criteria for energy efficiency. However, proper refrigerant charge and proper air flow are critical to achieve rated capacity and efficiency. Installation of this product should follow the manufacturer's refrigerant charging and air flow instructions. **Failure to confirm proper charge and airflow may reduce energy efficiency and shorten equipment life.**

**IMPORTANT:** Reconnect all grounding devices. All parts of this product capable of conducting electrical current are grounded. If grounding wires, screws, straps, clips, nuts, or washers used to complete a path to ground are removed for service, they must be returned to their original position and properly fastened.

**IMPORTANT:** Wear appropriate gloves, arm sleeve protectors, and eye protection when servicing or maintaining this equipment.

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## Introduction

Read this manual carefully before attempting to install, operate, or perform maintenance on this unit. Installation and maintenance should be performed by qualified service technicians only. This unit is listed by Underwriters Laboratory.

Model 4WCZ6 heat pump units are designed for outdoor mounting with a vertical condenser discharge. They can be located either at ground level or on a roof in accordance with local codes. Each unit contains an operating charge of refrigerant as shipped.

Extreme mounting kits are available for slab (BAYEXMK003AA), utility curb (BAYEXMK002AA) and perimeter curb (BAYEXMK001AA) mountings.

This guide is organized as follows:

- Step 1 - Inspect Shipment
- Step 2 - Determine Unit Clearances
- Step 3 - Review Location and Recommendation Information
- Step 4 - Unit Installation
- Step 5 - Unit Startup
- Sequence of Operation
- Maintenance

## Step 1—Inspect Shipment

1. Check for damage after the unit is unloaded. Report promptly to the carrier any damage found to the unit. Do not drop the unit.

**IMPORTANT:** To prevent damage to the sides and top of the unit when hoisting, retain the top shipping skid on the unit or use "spreader bars" as shown on page 13.

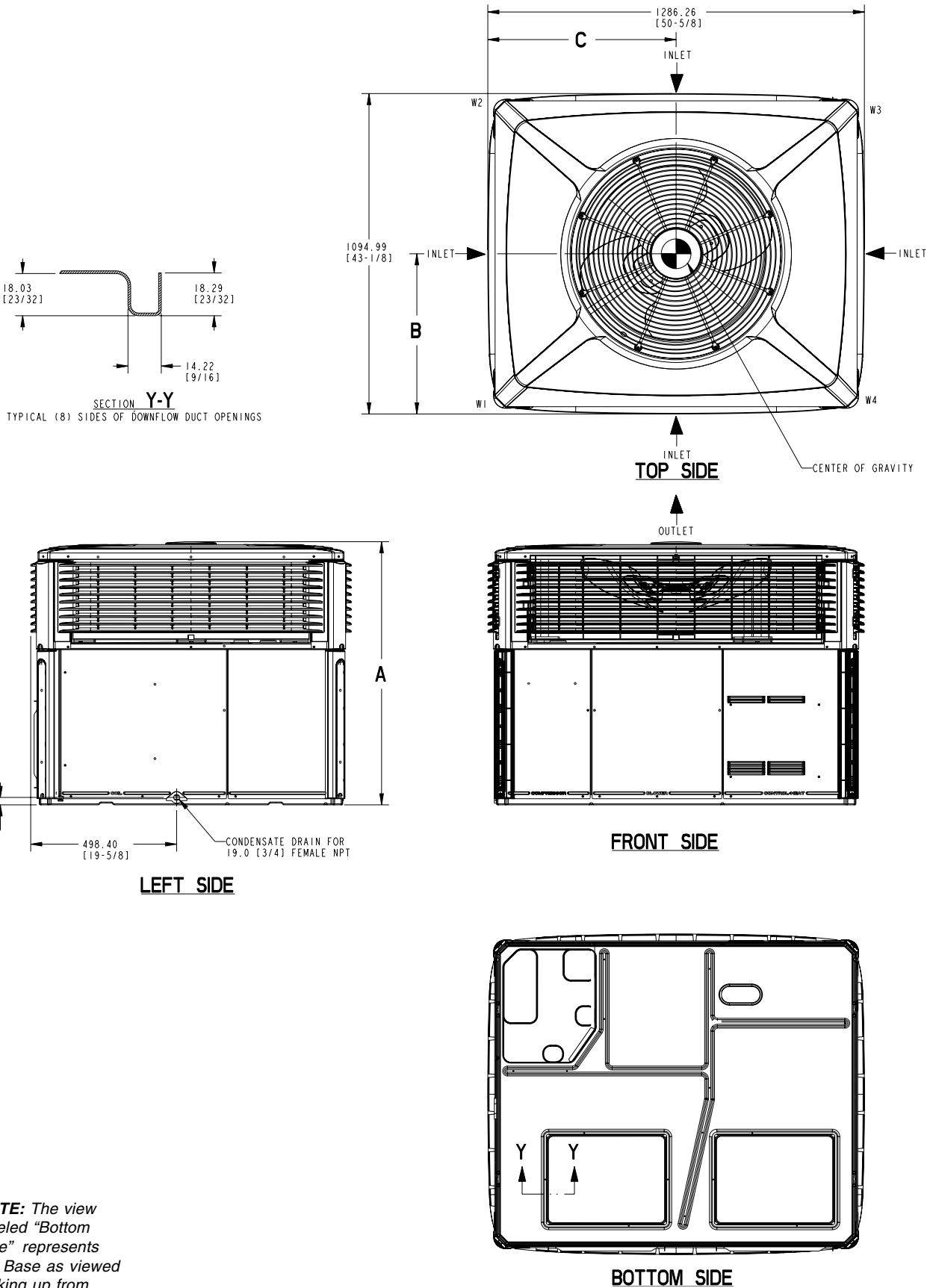
2. Check the unit's nameplate to determine if the unit is correct for the intended application. The power supply must be adequate for both the unit and all accessories.
3. Check to be sure the refrigerant charge has been retained during shipment. Remove the Compressor access panel to access the 1/4" flare pressure taps.
4. If this unit is being installed on a curb, verify that the correct curb is provided with the unit.
  - 4WCZ6036 uses model BAYCURB050A.
  - 4WCZ6048 and 4WCZ6060 use model BAYCURB051A.
5. If the unit is being hoisted, accessory kit BAYLIFT002AA is recommended. It includes a kit of four (4) lifting lugs and instructions.

**NOTE:** If practical, install any internal accessories to the unit at the shop.

\_\_\_\_\_

## Step 2—Determine Unit Clearances

Figures 1 through 6 show the unit critical dimensions.

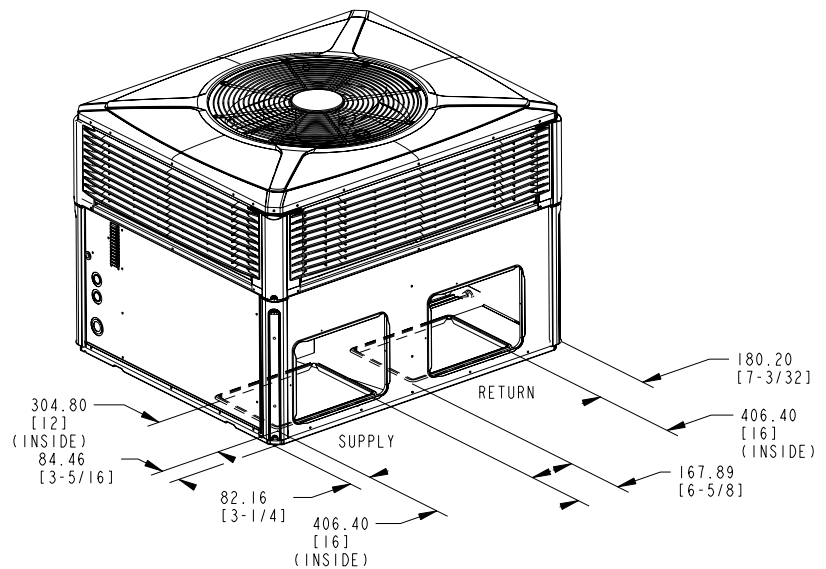


**NOTE:** The view labeled “Bottom Side” represents the Base as viewed looking up from underneath the unit.

**Figure 1. 4WCZ6036A (1 of 3)**

RECOMMENDED SERVICE CLEARANCE MM/IN.		
		WITH ECONOMIZER
BACK SIDE	304.8 [12]	762.0 [30]
LEFT SIDE	762.0 [30]	914.4 [36]
RIGHT SIDE	609.6 [24]	-
FRONT SIDE	1066.8 [42]	-

CLEARANCE TO COMBUSTIBLE MATERIAL MM/IN.	
BOTTOM	0
BACK SIDE	25.4 [1]
LEFT SIDE	152.4 [6]
RIGHT SIDE	152.4 [6]
FRONT SIDE	304.8 [12]
TOP	914.4 [36]



## BOTTOM DUCT OPENINGS

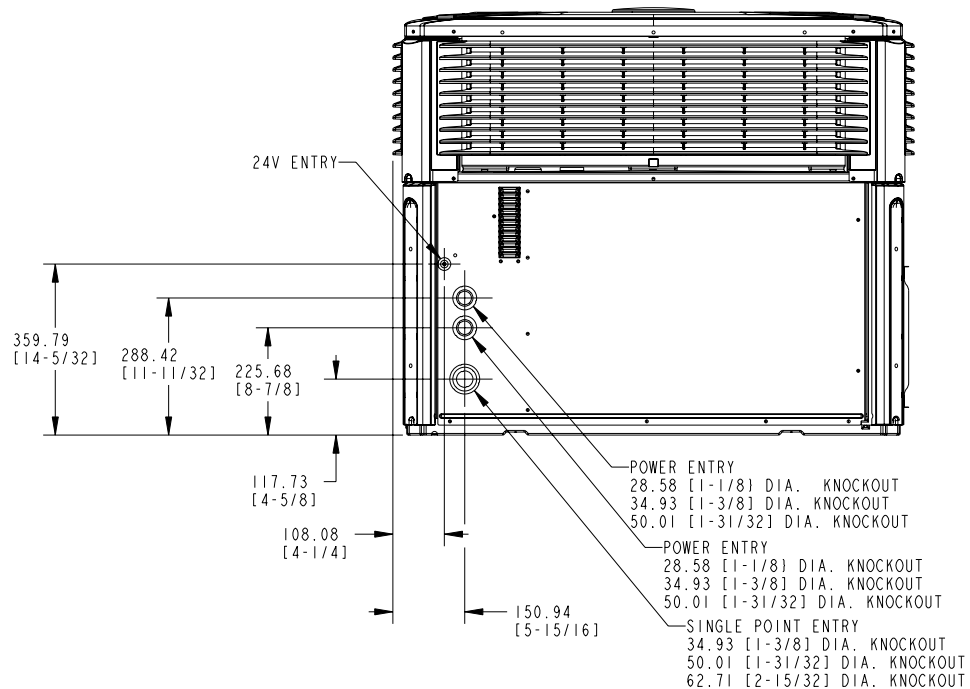
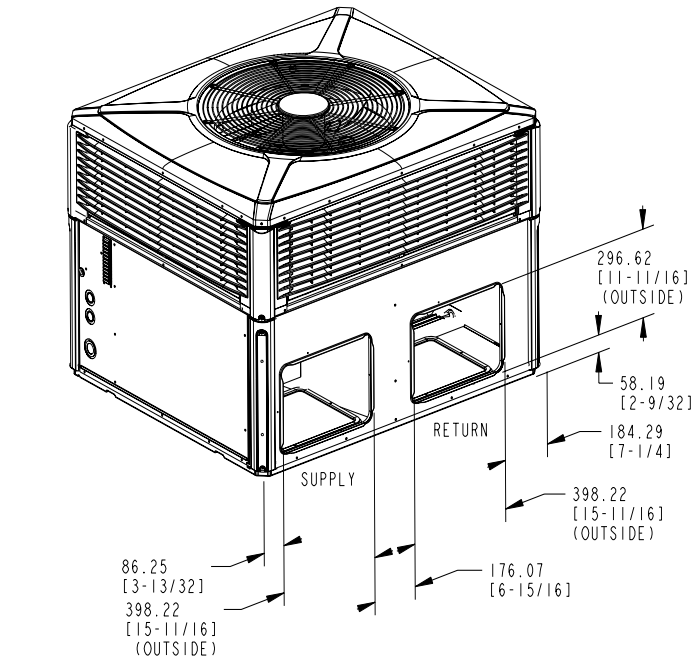
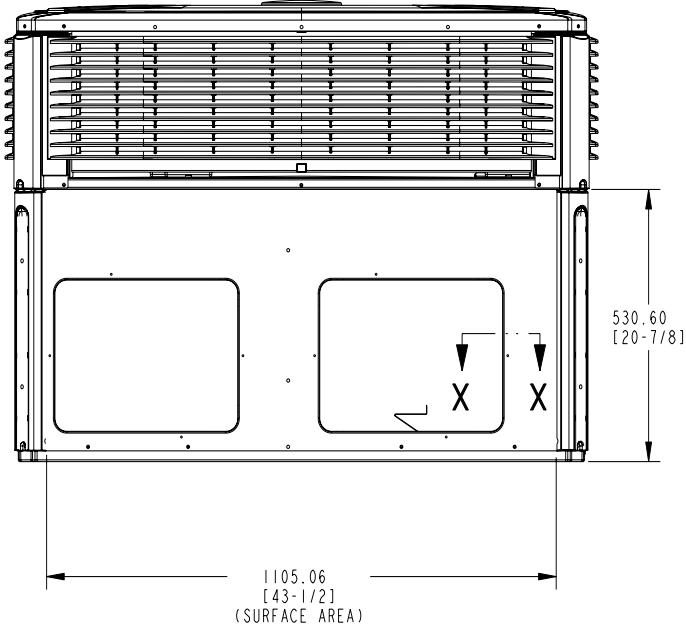


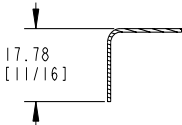
Figure 2. 4WCZ6036A (2 of 3) **RIGHT SIDE**



BACK DUCT OPENINGS



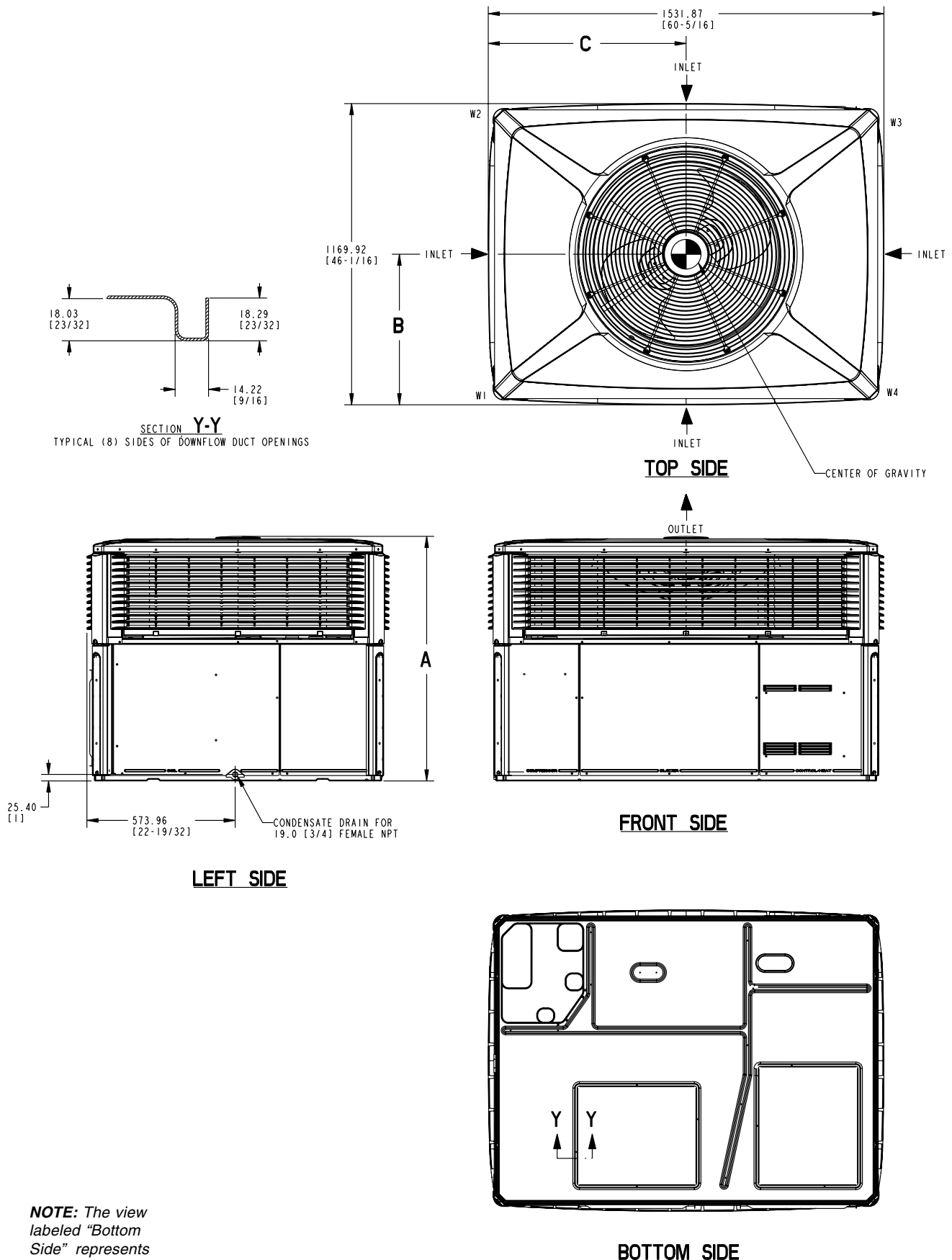
BACK SIDE



SECTION X-X  
TYPICAL (8) SIDES OF SIDEFLOW DUCT OPENINGS

MODEL	HEIGHT MM/IN.	APPROX. CORNER WEIGHT - KG/LBS				TOTAL UNIT WEIGHT KG/LBS	CENTER OF GRAVITY MM/IN.	
	A	W1	W2	W3	W4		B	C
4TCY4024	898.53 [35-3/8]	56.7 [125]	35.8 [79]	25.4 [56]	39.9 [88]	157.9 [348]	401.3 [15.8]	508.0 [20.0]
4TCY4036	949.33 [37-3/8]	57.6 [127]	36.3 [80]	25.9 [57]	40.8 [90]	160.6 [354]	401.3 [15.8]	508.0 [20.0]
4WCY4024	898.53 [35-3/8]	57.6 [127]	36.3 [80]	26.3 [58]	41.7 [92]	161.9 [357]	401.3 [15.8]	515.6 [20.3]
4WCY4036	949.33 [37-3/8]	60.8 [134]	38.1 [84]	27.2 [60]	42.6 [94]	168.7 [372]	401.3 [15.8]	508.0 [20.0]
4WCZ6036	949.33 [37-3/8]	60.8 [134]	38.1 [84]	27.2 [60]	42.6 [94]	168.7 [372]	401.3 [15.8]	508.0 [20.0]

Figure 3. 4WCZ6036A (3 of 3)

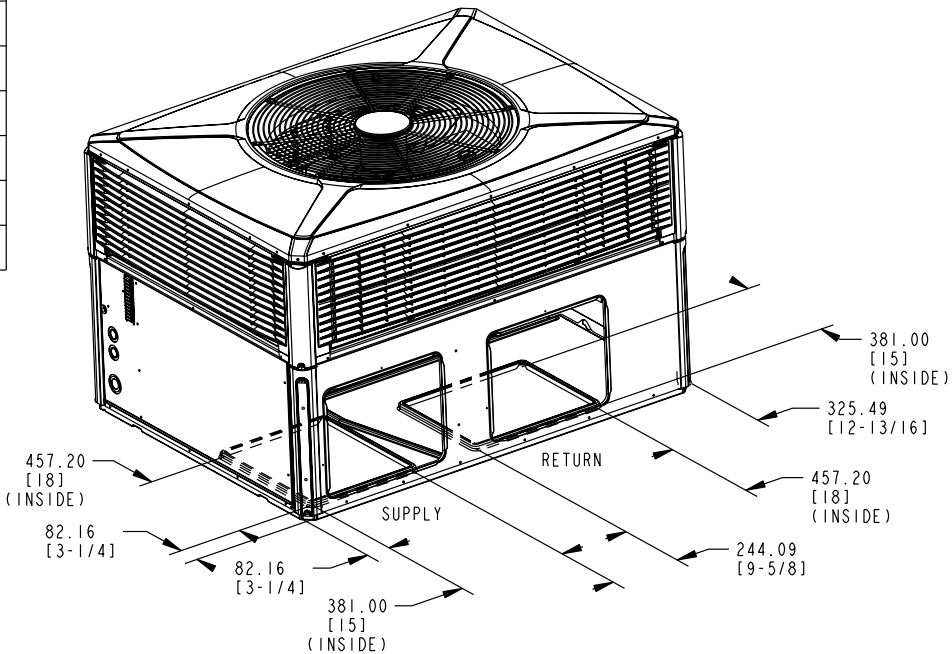


**NOTE:** The view labeled "Bottom Side" represents the Base as viewed looking up from underneath the unit.

**Figure 4. 4WCZ6048A through 4WCZ6060A (1 of 3)**

RECOMMENDED SERVICE CLEARANCE MM/IN.		
		WITH ECONOMIZER
BACK SIDE	304.8 [12]	762.0 [30]
LEFT SIDE	914.4 [36]	1066.8 [42]
RIGHT SIDE	609.6 [24]	-
FRONT SIDE	762.0 [30]	-

CLEARANCE TO COMBUSTIBLE MATERIAL MM/IN.	
BOTTOM	0
BACK SIDE	25.4 [1]
LEFT SIDE	152.4 [6]
RIGHT SIDE	152.4 [6]
FRONT SIDE	304.8 [12]
TOP	914.4 [36]



**BOTTOM DUCT OPENINGS**

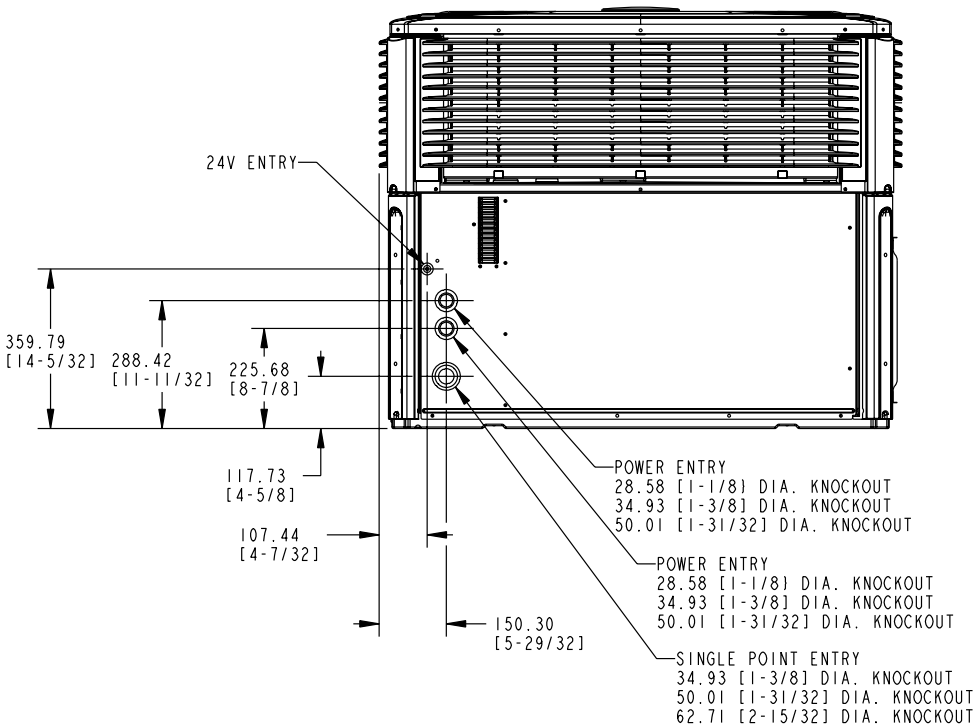
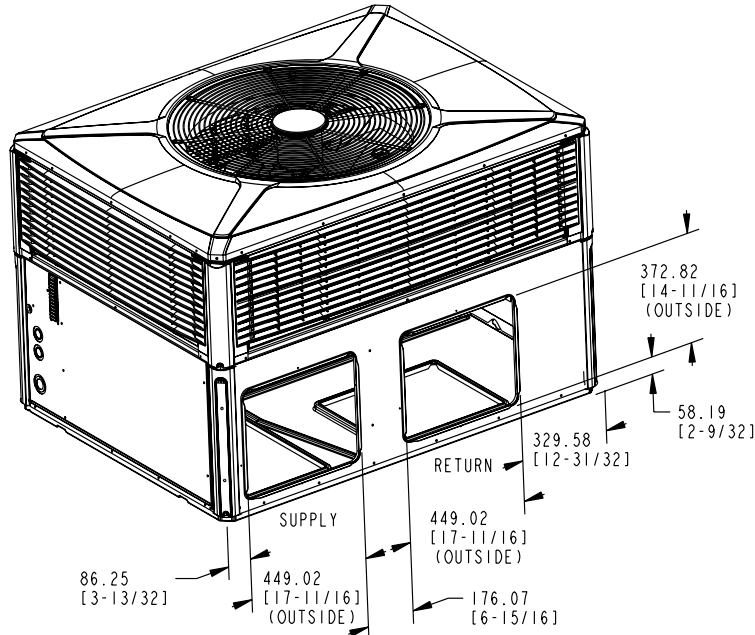
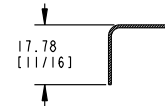


Figure 5. 4WCZ6048A through 4WCZ6060A (2 of 3)

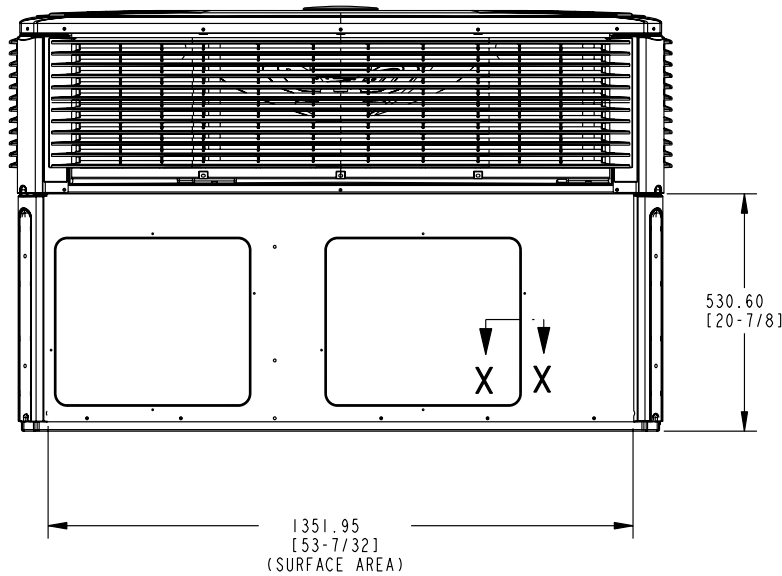




## BACK DUCT OPENINGS



SECTION X-X  
TYPICAL (8) SIDES OF SIDEFLOW DUCT OPENINGS



## BACK SIDE

MODEL	HEIGHT MM/IN.	APPROX. CORNER WEIGHT - KG/LBS				SHIPPING WEIGHT KG/LBS	TOTAL UNIT WEIGHT KG/LBS	CENTER OF GRAVITY MM/IN.	
	A	W1	W2	W3	W4			B	C
4TCY4048	949.33 [37-3/8]	76.2 [168]	47.6 [105]	35.8 [79]	57.6 [127]	275.6 (607)	217.3 [479]	426.7 [16.8]	635.0 [25.0]
4TCY4060	1050.93 [41-3/8]	78.9 [174]	46.7 [103]	34.9 [77]	59.1 [130]	277.8 (612)	219.5 [484]	414.0 [16.3]	635.0 [25.0]
4WCY4048	949.33 [37-3/8]	68.9 [152]	40.8 [90]	30.8 [68]	52.2 [115]	275.6 (607)	217.5 [479]	414.0 [16.3]	635.0 [25.0]
4WCY4060	1050.93 [41-3/8]	80.3 [177]	47.6 [105]	35.8 [79]	60.8 [134]	282.8 (623)	224.5 [495]	414.0 [16.3]	635.0 [25.0]
4WCZ6048	1050.93 [41-3/8]	68.9 [152]	40.8 [90]	30.8 [68]	52.2 [115]	275.6 (607)	217.5 [479]	414.0 [16.3]	635.0 [25.0]
4WCZ6060	1050.93 [41-3/8]	80.3 [177]	47.6 [105]	35.8 [79]	60.8 [134]	282.8 (623)	224.5 [495]	414.0 [16.3]	635.0 [25.0]

Figure 6. 4WCZ6048A through 4WCZ6060A (3 of 3)

## Step 3—Review Location and Recommendation Information

### CAUTION

Caution must be taken at all times to avoid personal injuries and/or damage to equipment.

**NOTE:** The unit is shipped for horizontal installation.

#### Horizontal Airflow Units

1. Location of the unit must allow service clearance around it to ensure adequate serviceability, maximum capacity, and peak operating efficiency.
2. These units are design certified for outdoor installation. They may be installed directly on a slab, wood flooring, or on Class A, B, or C roof covering material. The discharge air from the condenser fans must be unrestricted for a minimum of 3 feet above the unit.
3. Check the handling facilities to ensure the safety of personnel and the unit.
4. The unit must be mounted level for proper drainage of water through the drain holes in the base pan.
5. The unit should not be exposed to direct roof water runoff.
6. Flexible duct connectors must be of a flame retardant material. All duct work outside of the structure must be insulated and weatherproofed in accordance with local codes.
7. Holes through exterior walls or roof must be sealed in accordance with local codes.
8. All fabricated outdoor ducts should be as short as possible.

#### Clearances

1. The recommended clearances for single-unit installations are illustrated in Figures 1 through 6 pages 4-9.
2. Any reduction of the unit clearances indicated in these figures may result in condenser coil starvation or the recirculation of warm condenser air. Actual clearances, which appear to be inadequate should be reviewed with a local engineer.
3. See the unit's nameplate for the absolute minimum clearance between the unit and any combustible surfaces.

#### Down Airflow Units

1. Location of the unit must allow service clearance around it to ensure adequate serviceability, maximum capacity, and peak operating efficiency.
2. Refer to the Installation section (page 9) for instruction on converting the supply and return airflow covers to down airflow.
3. The field assembled Roof Mounting Curb (BAYCURB050A or BAYCURB051A) or a field fabricated curb should be in place **before** the unit is hoisted to the roof top.

**IMPORTANT:** The Roof Mounting Curb (frame) must be installed on a flat, level section of the roof (maximum of 1/4" per foot pitch) and provide a level mounting surface for the unit. Also, be sure to provide sufficient height above the roof to prevent water from entering the unit.

4. Be sure the mounting curb spans structural members (trusses) of the roof, thereby providing sufficient support for the weight of the unit, the curb, the duct(s), and any factory or field installed accessories.
5. Be sure the hole in the structure for the ducts is large enough to accommodate the fabricated ducts and the insulation surrounding them.
6. These units are design certified for outdoor installation. They may be installed directly on a slab, wood flooring, or on Class A, B, or C roof covering material. The discharge air from the condenser fans must be unrestricted for a minimum of three (3) feet above the unit.
7. Exhaust vents or other sources of contaminated air should not be near the unit's air inlet if outside air is to be introduced as make-up air or a ventilation feature is to be used. Contamination from exhaust vents or chimneys may also foul the condenser causing degraded performance.
8. Check the handling facilities to ensure the safety of personnel and the unit(s).

#### Clearances

1. The recommended clearances for single-unit installations are illustrated in Figures 1 through 6, pages 4-9.
2. Any reduction of the unit clearances indicated in these figures may result in condenser coil starvation or the recirculation of warm condenser air. Actual clearances, which appear to be inadequate should be reviewed with a local engineer.
3. See the unit's nameplate for the absolute minimum clearance between the unit and any combustible surfaces.

## Step 4—Unit Installation

**NOTE:** The unit is shipped for horizontal installation.

### Ground Level Installation

To install the unit at ground level:

1. Place the unit on a pad the size of the unit or larger. The unit must be mounted level for proper drainage of water through the holes in the base pan.

The pad must not come in contact with the structure (see Figure 7, below.) Be sure the outdoor portion of the supply and return air ducts are as short as possible.

2. Location of the unit must allow service clearance around it. Clearance of the unit must be given careful consideration. See Figures 1 through 6, pages 4-9.

**NOTE:** Any reduction of the unit clearances indicated in these illustrations may result in condenser coil starvation or the recirculation of warm condenser air. Actual clearances, which appear to be inadequate should be reviewed with a local engineer.

3. Attach the supply and return air ducts to the unit as explained in the Ductwork Installation section (page 15).
4. Flexible duct connectors must be of a flame retardant material. Insulate any ductwork outside of the structure with at least two (2) inches of insulation and weatherproof. There must be a weatherproof seal where the duct enters the structure.
5. The unit should not be exposed to direct roof water runoff.
6. Seal all holes through exterior walls in accordance with local codes.
7. Continue with the following installation sections to complete the installation: Ductwork (page 15), Filter (page 16), and Electrical Wiring (page 16).

### Rooftop Installation – Curb Mounting

#### Convert Horizontal Airflow to Down Airflow

The factory ships the unit for horizontal airflow. Perform this procedure to convert it to down airflow:

1. Remove the three (3) sheet metal screws securing the supply air cover and the four (4) sheet metal screws securing the return air cover from the base of the unit. Remove the covers from the base. See Figure 8, page 12.
2. Place the covers over the horizontal supply and return openings (painted side out). Align the screw holes, and secure using the same screws removed in step 1.

#### Install Full Perimeter Roof Mounting Curb

1. Verify that the roof mounting curb is correct for the unit.
  - 4WCZ6036 uses model BAYCURB050A.
  - 4WCZ6048 and 4WCZ6060 use model BAYCURB051A.
2. Assemble and install the curb following the instruction in the appropriate Installer's Guide.

### Lifting and Rigging

1. Before preparing the unit for lifting, check the unit dimension drawings for center of gravity for lifting safety (Figures 1 to 6). Because of placement of internal components, the unit's weight may be unevenly distributed. Approximate unit weights are also provided in the unit drawings.

**NOTE:** Unit rigging and hoisting requires accessory kit BAYLIFT002AA. It includes a kit of four (4) lifting lugs. See Figure 9 inset B.

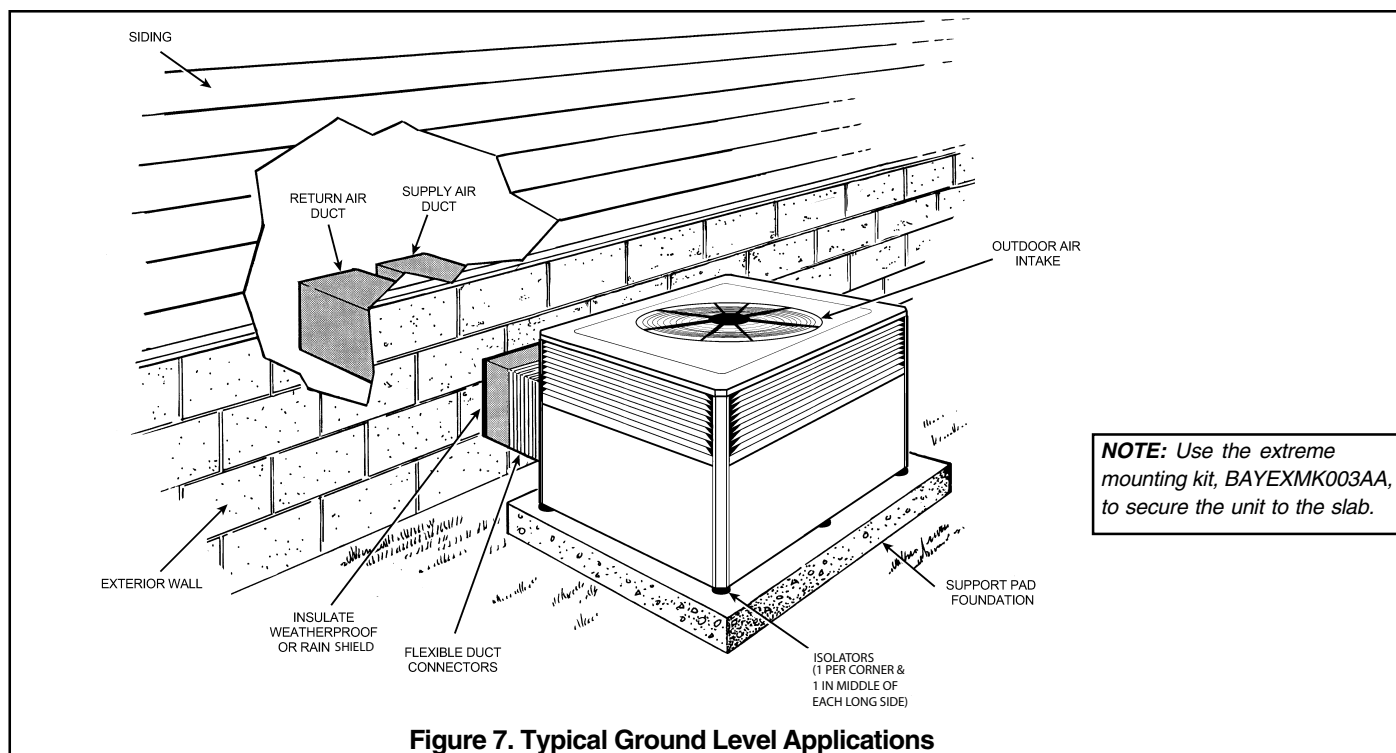
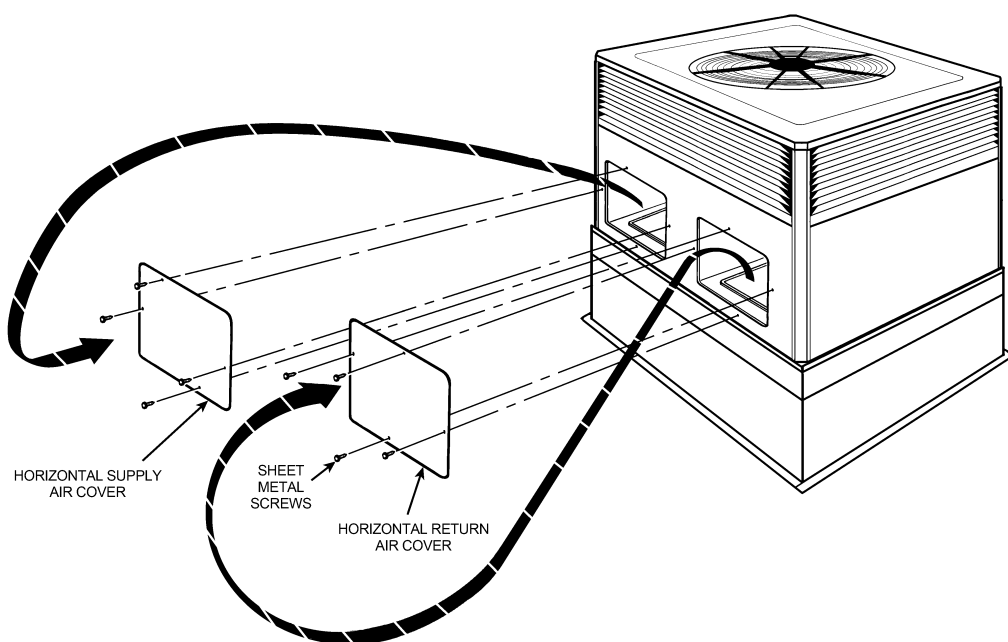


Figure 7. Typical Ground Level Applications



**Figure 8. Converting Horizontal to Down Airflow**

2. Insert the four (4) lifting lugs in the openings provided in the drip lip on each end of the unit. See Figure 9 inset B, page 13. A tap or jerk to the lug will overcome the interference that arises due to the dimple on the lug.

3. When hoisting the unit, be sure that a proper method of rigging is used. Use either the unit's top shipping skid and straps or slings and spreader bars for protection during lifting. Always test-lift the unit to determine the exact unit balance and stability before hoisting it to the installation location.

**IMPORTANT:** Do not lift the unit without test lifting for balance and rigging. Do not lift the unit in windy conditions or above personnel. Do not lift the unit by attaching clevis, hooks, pins, or bolts to the unit casing, casing hardware, corner lugs, angles, tabs, or flanges. Failure to observe these warnings may result in equipment damage.

4. When the curb and air ducts have been properly installed, the unit is ready to be hoisted to the roof and set in position.

**IMPORTANT:** To prevent damage to the sides and top of the unit when hoisting, retain the top shipping skid on the unit or use "spreader bars" as shown on page 13.

**IMPORTANT:** The unit must be lowered into position. The P.V.C. rubber tape on the curb flange permits the unit to be repositioned if required without destroying the P.V.C. rubber seals affixed to the mounting curb.

## Placing the Unit on the Mounting Curb

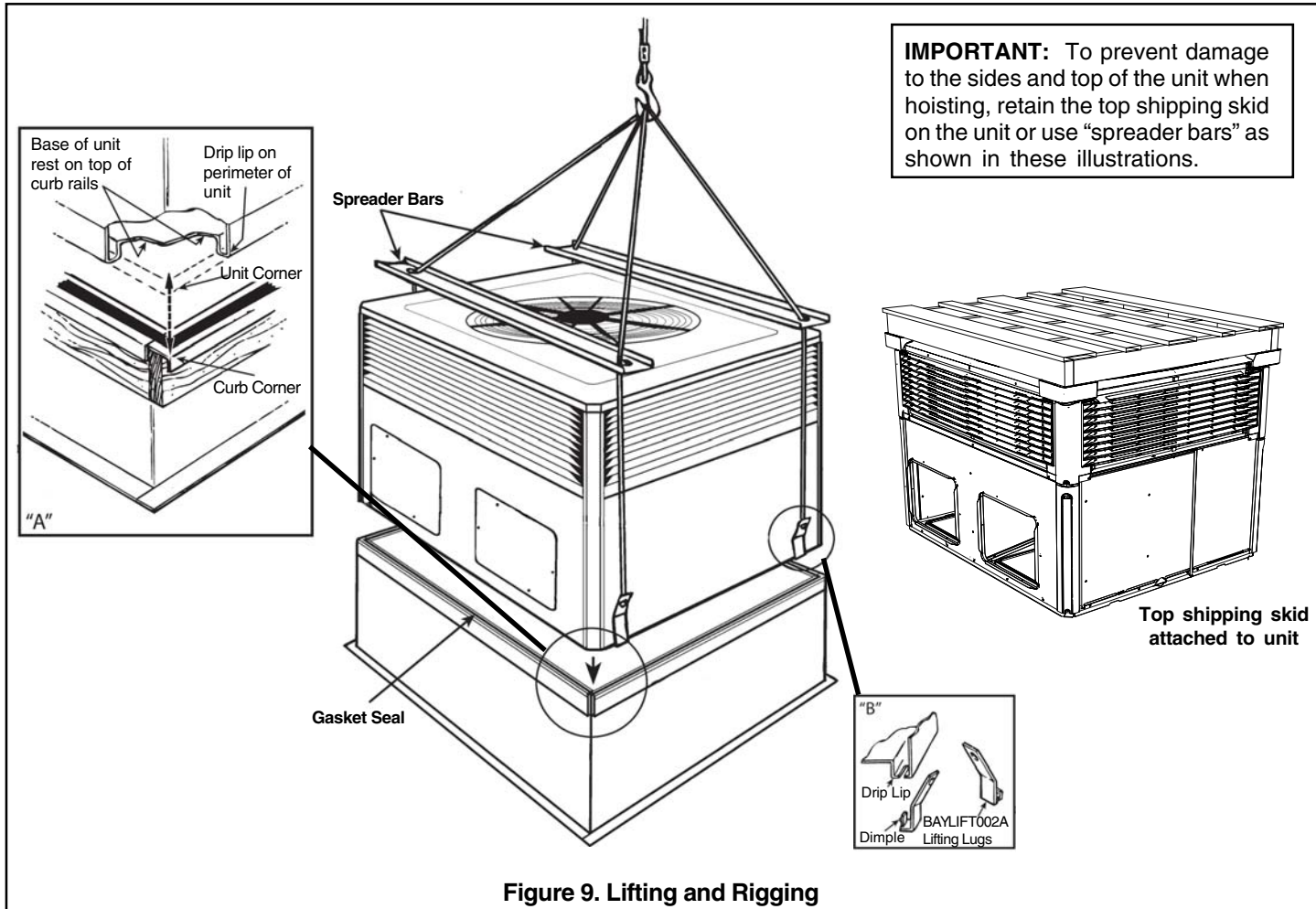
1. The unit is designed with a perimeter drip lip that is lower than the unit base pan, see Figure 9, inset A, page 13.
2. Position the unit drip lip down over and in contact with the outside corner of the curb. Continue to lower the unit on top of the curb, with the unit drip lip astraddle, and in contact with, both the end and side rail of the curb. The unit should now rest on top of the curb.
3. Take the hold-down brackets shipped with the curb (utility curb only) and secure the unit to the curb.

**NOTE** The ductwork is installed as part of the curb installation. Do not attach ductwork to the unit and lower the unit with ductwork onto the curb.

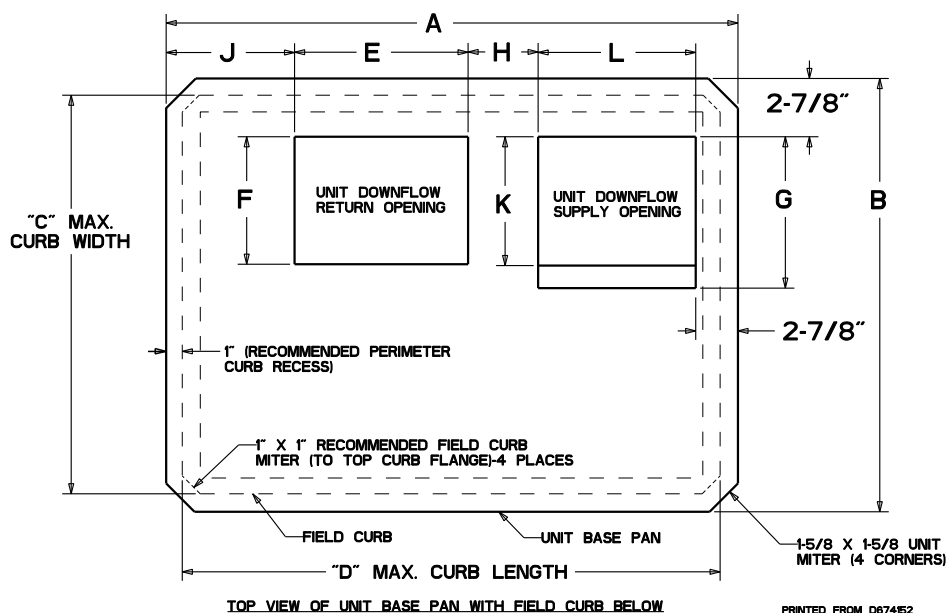
## Rooftop Installation – Frame Mounting

For roof top applications using a field fabricated frame and ducts, use the following procedure:

1. Locate and secure the frame to the roof by bolting or welding. Add flashing as required. Flashing must conform to local building codes.
2. Prepare the hole in the roof in advance of installing the unit.
3. Secure the horizontal or down airflow ducts to the roof. Refer to the previous Convert from Horizontal Airflow to Down Airflow section, page 11, if conversion is needed.
4. All fabricated outdoor ducts should be as short as possible.
5. Place the unit on the frame. Refer to Figures 11 or 12, page 14.
6. The unit must be mounted level for proper drainage of water through the holes in the base pan.
7. Secure the unit to the frame.
8. Insulate any ductwork outside of the structure with at least two (2) inches of insulation and then weatherproof. There must be a weatherproof seal where the duct enters the structure.
9. The unit should not be exposed to direct roof water runoff.
10. Flexible duct connectors must be of a flame retardant material. All duct work outside of the structure must be insulated and weatherproofed in accordance with local codes.
11. Access and service clearances for the unit must be given careful consideration when locating the duct entrance openings. Figures 1 - 6, pages 4-9, provides unit dimensions.
12. Continue with the following installation sections to complete the installation: Ductwork (page 15), Filter (page 16), and Electrical Wiring (page 16).



**Figure 9. Lifting and Rigging**



MODEL	A	B	C	D	E	F	G	H	J	K	L
2/4 TC*, YC*, WC*, DC*018, 024, 030, 036	48-3/8	40-7/8	38-7/8	46-3/8	16	12	18	6-5/8	6-7/8	12	16
2/4 TC*, YC*, WC*, DC*042, 048, 060	58	43-7/8	41-7/8	56	18	15	18	9-5/8	12-1/2	15	15

This drawing was prepared by the manufacturer in order to provide detail regarding job layout only. This drawing is not intended to be used as a basis to construct, build or modify the item depicted in the drawing. The manufacturer is not responsible for the unauthorized use of this drawing and expressly disclaims any liability for damages resulting from such unauthorized use.

**Figure 10. Curb Dimensions**

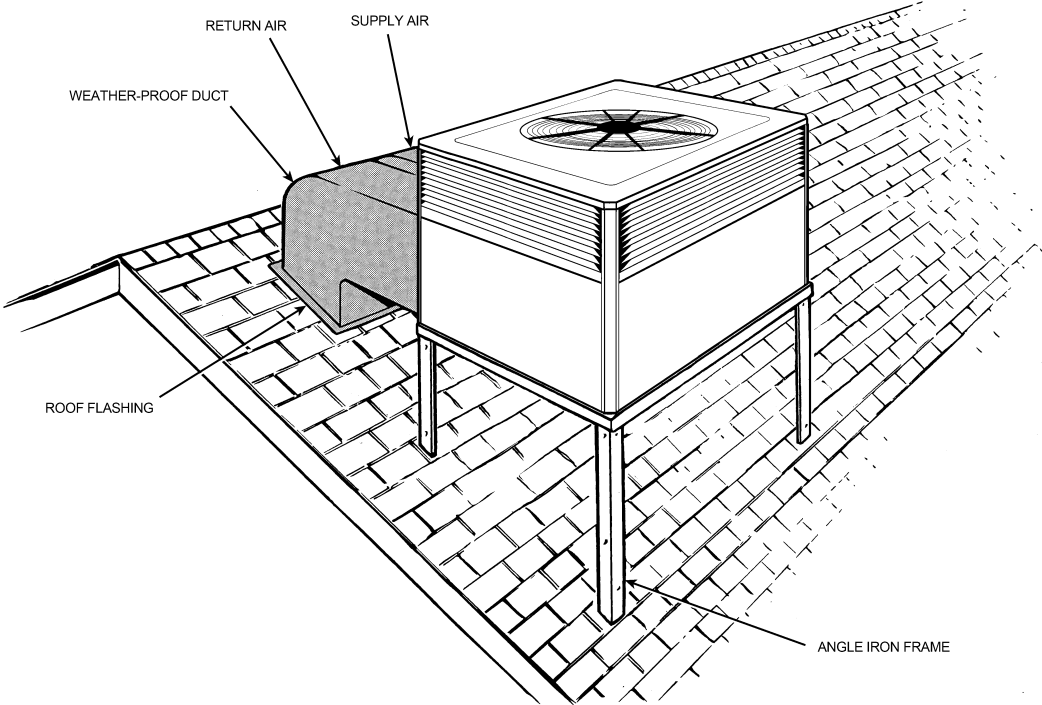


Figure 11. Typical Rooftop Horizontal Airflow Application with Frame

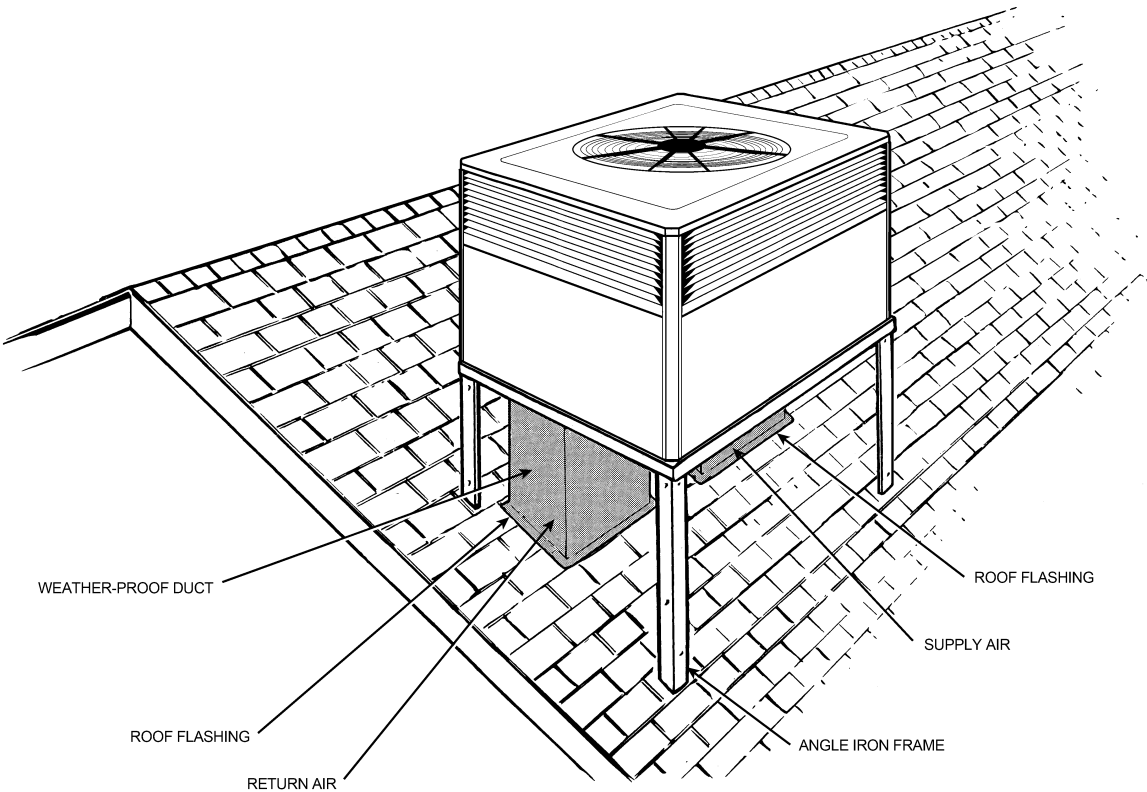


Figure 12. Typical Rooftop Down Airflow Application with Frame

## Ductwork Installation

### Attaching Downflow Ductwork to Roof Curb

Supply and return air flanges are provided on the roof curb for easy duct installation. All ductwork must be run and attached to the curb before the unit is set into place.

### Attaching Downflow Ductwork to Roof Frame

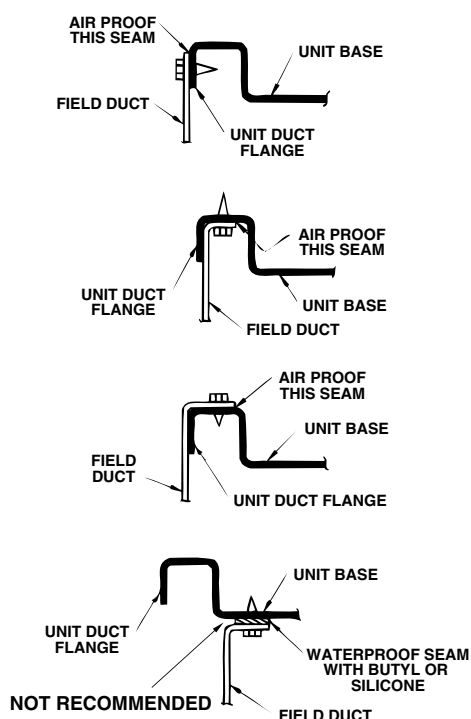
Follow these guidelines for ductwork construction:

Connections to the unit should be made with three (3) inch canvas connectors to minimize noise and vibration transmission.

Elbows with turning vanes or splitters are recommended to minimize air noise and resistance.

The first elbow in the ductwork leaving the unit should be no closer than two (2) feet from the unit, to minimize noise and resistance.

To prevent leaking, do not attach the ductwork to the bottom of the unit base. Refer to the bottom example in Figure 13, below.



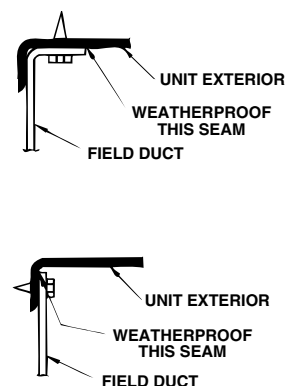
**Figure 13. Attaching Down Airflow Ductwork**

### Attaching Horizontal Ductwork to Unit

All conditioned air ductwork should be insulated to minimize heating and cooling duct losses. Use a minimum of two (2) inches of insulation with a vapor barrier. The outside ductwork must be weatherproofed between the unit and the building.

When attaching ductwork to a horizontal unit, provide a flexible watertight connection to prevent noise transmission from the unit to the ducts. The flexible connection **must** be indoors and made out of heavy canvas.

**NOTE:** Do not draw the canvas taut between the solid ducts.



**Figure 14. Attaching Horizontal Airflow Ductwork**

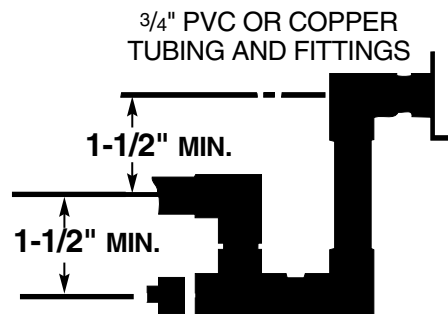
## Condensate Drain Piping

A 3/4-inch female NPT condensate drain connection is provided on the evaporator access panel end of the unit. Provide a trap and fill it with water before starting the unit to avoid air from being drawn through. Follow local codes and standard piping practices when running the drain line. Pitch the line downward away from the unit. Avoid long horizontal runs. See Figure 15, below.

**NOTE:** Do not use reducing fittings in the drain lines.

The condensate drain must be:

- Made of 3/4" pipe size.
- Pitched 1/4" per foot to provide free drainage to convenient drain system.
- Trapped.
- Must not be connected to a closed drain system unless the trap is properly vented.



**Figure 15. Typical Condensate Drain Piping**

# Installer's Guide

## Air Filter Installation

The 4WCZ6 heating/cooling unit requires an air filter. A filter frame accessory is offered that will allow the installation of a filter within the unit.

Otherwise a filter rack must be installed by the installer in the return duct work.

Affix the filter label supplied with the unit adjacent to the filter area. Refer to Table 1 to determine filter size.

**Table 1. Determine Filter Size**

UNIT	NOMINAL CFM	FILTER* SIZE (Sq. Ft.)	FILTER RESISTANCE ("W.C.")
4WCZ6036	1200	4	0.08
4WCZ6048	1600	5.33	0.08
4WCZ6060	2000	6.67	0.08

\*Filters must be installed in the return air system. The above square footages are based on 300 F.P.M. face velocity. If permanent filters are used, size per mfg. Recommendation with clear resistance of 0.05"W.C."

## Electrical Wiring

**NOTE:** This unit is factory wired for 230V. See wiring diagram for 208V conversion.

### Electrical Connections

Electrical wiring and grounding must be installed in accordance with local codes or, in the absence of local codes, with the National Electrical Code ANSI/NFPA 70, Latest Revision.

#### Electrical Power

It is important that proper electrical power be available for the unit. Voltage variation should remain within the limits stamped on the unit's nameplate.

#### Disconnect Switch

Provide an approved weatherproof disconnect within close proximity and **within sight of the unit**.

#### Over Current Protection

The branch circuit feeding the unit must be protected as shown on the unit's nameplate.

#### Power Wiring

The power supply lines must be run in weather-tight conduit to the disconnect and into the side of the unit control box. Provide strain relief for all conduit with suitable connectors.

**NOTE:** For branch circuit wiring (main power supply to unit disconnect), determine wire size for the length of run using the circuit ampacity found on the unit's nameplate and the N.E.C.

For more than three (3) conductors in a raceway or cable, see the N.E.C. for derating the ampacity of each conductor.

Provide flexible conduit supports whenever vibration transmission may cause a noise problem within the building structure.

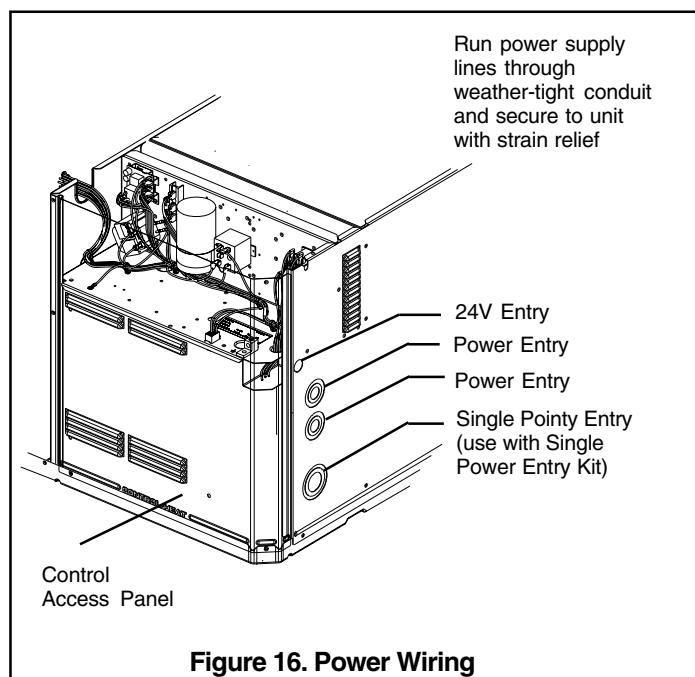
For units that are configured for single point entry, refer to the appropriate Single Power Entry Kit Installer's Guide to connect power.

For units that are configured with supplemental heat, refer to the appropriate Supplemental Electric Heater Installer's Guide to connect heater power.

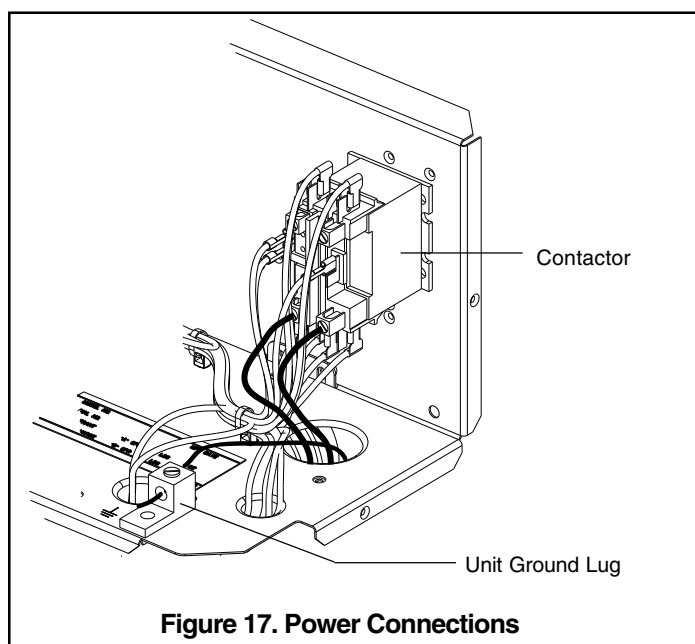
To connect power to the unit:

1. Remove the Control access panel. Pass the power wires through the Power Entry hole in the end of the unit. See Figure 16 below.
2. Connect the high voltage wires to the appropriate contactor terminals. Single phase units use a two (2) pole contactor and three phase units use a three (3) pole contactor. Connect the ground to the ground lug on the chassis. See Figure 17 below. Be sure all connections are tight.

**GROUNDING: THE UNIT MUST BE ELECTRICALLY GROUNDED IN ACCORDANCE WITH LOCAL CODES OR THE NATIONAL ELECTRIC CODE.**



**Figure 16. Power Wiring**

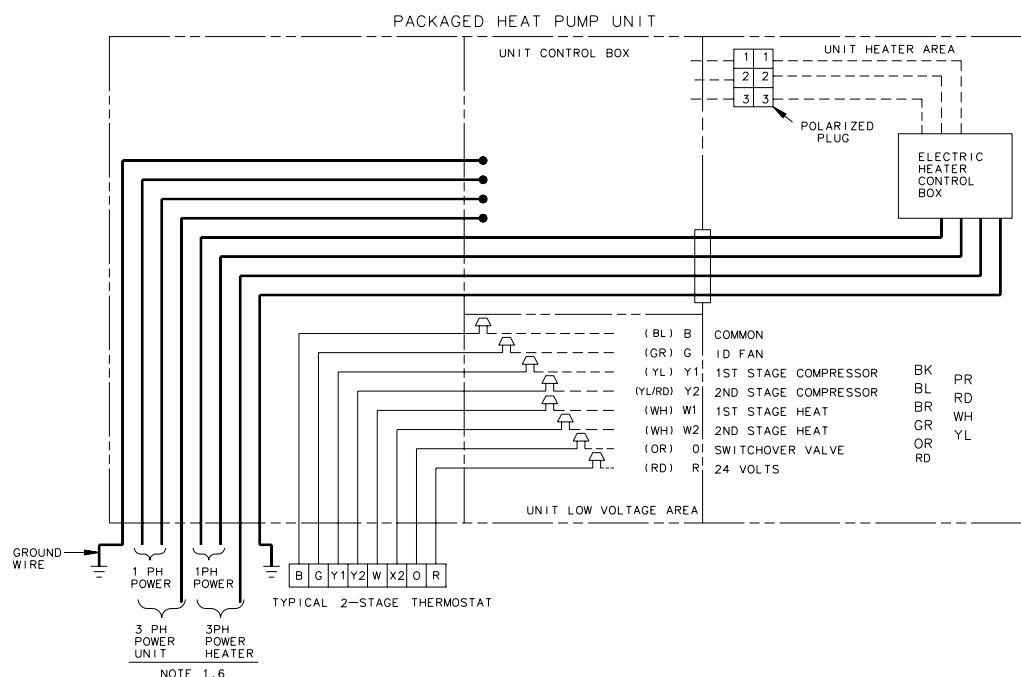


**Figure 17. Power Connections**

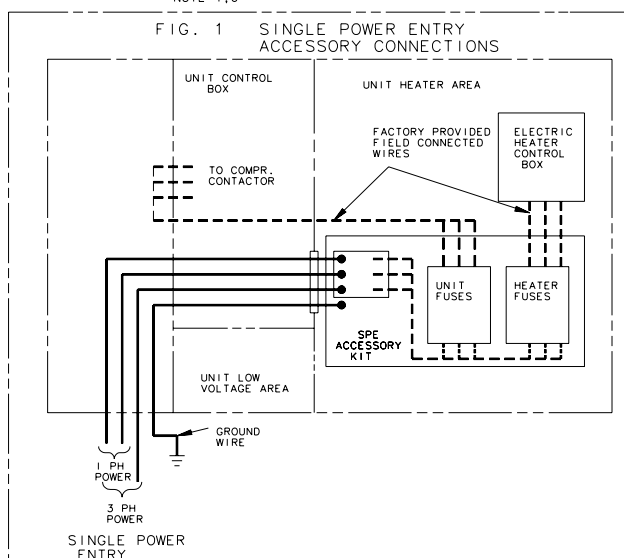


## NOTES:

1. FUSED DISCONNECT SIZE, POWER WIRING AND GROUNDING OF EQUIPMENT MUST COMPLY WITH CODES.
2. BE SURE POWER SUPPLY AGREES WITH EQUIPMENT AND HEATER NAMEPLATE.
3. LOW VOLTAGE WIRING TO BE 18 AWG MINIMUM CONDUCTOR.
4. SEE HEATER NAMEPLATE FOR CURRENT RATING OF HEATER USED.
5. SEE UNIT AND HEATER DIAGRAM FOR ELECTRICAL CONNECTION DETAILS.
6. IF ELECTRIC HEATER ACCESSORY IS NOT INSTALLED OMIT THE ELECTRIC HEATER, ASSOCIATED POWER WIRES AND THE W AND X2 THERMOSTAT WIRES.
7. FIG. 2 DEMONSTRATES CONNECTION OF THE OUTDOOR THERMOSTAT ACCESSORY ONLY. FOR FURTHER UNIT CONNECTION DETAILS REFER TO THE OTHER FIGURES.
8. THE W1 (WH) WIRE IS FIRST STAGE ELECTRIC HEAT. IF THE ELECTRIC HEATER ACCESSORY HAS TWO HEATING STAGES THE W2 (WH) WIRE IS SECOND STAGE ELECTRIC HEAT.
9. THE BAYSTAT033A OUTDOOR THERMOSTAT ACCESSORY KIT CONTAINS A THERMOSTAT AND A RELAY. THE RELAY IS NOT REQUIRED TO BE USED IN THIS APPLICATION.



**FIG. 1 SINGLE POWER ENTRY ACCESSORY CONNECTIONS**



**FIG. 2**

**OUTDOOR THERMOSTAT ACCESSORY CONNECTIONS**

## INTER-COMPONENT WIRING

----- 24V. LINE V. } FACTORY WIRING  
 ----- 24V. LINE V. } FIELD WIRING

WIRE COLOR DESIGNATION			
ABBR	COLOR	ABBR	COLOR
BK	BLACK	PR	PURPLE
BL	BLUE	RD	RED
BR	BROWN	WH	WHITE
GR	GREEN	YL	YELLOW
OR	ORANGE		

**Figure 18. WC Field Wiring Diagram**

# Installer's Guide

## Control Wiring (Class II)

Low voltage control wiring should not be run in conduit with power wiring unless Class 1 wire of proper voltage rating is used. Route the thermostat cable or equivalent single leads of No. 18 AWG colored wire from the thermostat subbase terminals through the rubber grommet on the unit. See Figures 1-6 (pages 4-9) for the control entry (24V Entry) location. Make connections as shown on the field wiring diagram Figure 18, page 17.

Do not short thermostat wires since this will damage the control transformer.

Refer to Table 2 for recommended wire sizes and lengths for installing the unit thermostat. The total resistance of these low voltage wires must not exceed one (1) ohm. Any resistance in excess of 1 ohm may cause the control to malfunction because of the excessive voltage drop.

**Table 2. Thermostat Wire Size and Maximum Length**

WIRE SIZE	MAXIMUM LENGTH (Ft)
18	75
16	125
14	200

**IMPORTANT:** Upon completion of wiring, check all electrical connections, including factory wiring within the unit, and make sure all connections are tight. Replace and secure all electrical box covers and access panels before leaving the unit or turning on the power to the unit.

## Step 5—Unit Startup

### Pre-Start Quick Checklist

- ☐ Is the unit properly located and level with the proper clearance? See Figures 1-6, pages 4-9. See Step 2-Review Location and Clearances on page 4.
- ☐ Is the duct work correctly sized, run, taped, insulated, and weatherproofed with proper unit arrangement? See Ductwork Installation section on page 15.
- ☐ Is the condensate line properly sized, run, trapped, and pitched? See Condensate Drain Piping section on page 15.
- ☐ Is the filter of the correct size and quantity? Is it clean and in place? See Air Filter Installation section on page 16.
- ☐ Is the wiring properly sized and run according to the unit wiring diagram? See Electrical Wiring section on page 16.
- ☐ Are all the wiring connections, including those in the unit, tight? See Electrical Wiring section on page 16.
- ☐ Has the unit been properly grounded and fused with the recommended fuse size? See Electrical Wiring section on page 16.
- ☐ Is the thermostat well located, level, and correctly wired? See Electrical Wiring section on page 16.
- ☐ Have the air conditioning systems been checked at the service ports for charge and leak tested if necessary?
- ☐ Do the condenser fan and indoor blower turn free without rubbing, and are they tight on the shafts?
- ☐ Has all work been done in accordance with applicable local and national codes?

- ☐ Are all covers and access panels in place to prevent air loss and safety hazards?

## Starting the Unit in Cooling Mode

### WARNING

Safety Hazard. Do not operate the unit without the evaporator fan access panel or evaporator coil access panel in place. Reinstall the access panels after performing maintenance procedures on the fan. Operating the unit without the access panels properly installed may result in severe personal injury or death.

### CAUTION

Before starting the system on the cooling cycle, turn the thermostat switch to **OFF** and close the unit disconnect switch. This is a precaution against foaming at startup which could damage the compressor bearings.

**NOTE:** See the section on Sequence of Operation, page 19 for a description of the cooling operating sequence.

To start the unit in the cooling mode, set the thermostat system switch to **COOL** and move the thermostat **COOL** indicator to a setting below room temperature. The condenser fan motor, compressor and evaporator fan motor will operate automatically.

### Operating Pressure Checks

After the unit has operated in the cooling mode for a short period of time, install pressure gauges on the gauge ports of the discharge and suction line valves (behind the Compressor access panel). Check the suction and discharge pressures and compare them to the normal operating pressures provided in the unit's **SERVICE FACTS**.

**NOTE:** Do not use the pressures from the unit's **SERVICE FACTS** to determine the unit refrigerant charge. The correct charge is shown on the unit nameplate. To charge the system accurately, weigh in the charge according to the unit nameplate.

### Voltage Check

With the compressor operating, check the line voltage at the unit (contactor is located behind the Control access panel). The voltage should be within the range shown on the unit nameplate. If low voltage is encountered, check the size and length of the supply line from the main disconnect to the unit. The line may be undersized for the length of the run.

### Cooling Shut Down

At the thermostat, set the system selector to **OFF** or reset the thermostat to a setting above room temperature.

## Starting the Unit in Heating Mode

**NOTE:** See the section on Sequence of Operation for a description of the heat pump heating operating sequence.

Check that all grills and registers are open and all unit access panels are closed before start-up.

Set the thermostat above room temperature, achieving a first stage call for heat, and set the fan to **AUTO** or **ON**.

### Heating Shut Down

Set the thermostat to **OFF** or place the heating selector at a setting below room temperature.

## Sequence of Operation

### General

Operation of the unit heating and cooling cycles is automatic when the system is set to **HEAT** or **COOL** (the optional automatic changeover thermostat, when set to **AUTO**, automatically changes to heat or cool with an appropriate room temperature change). The fan can be set to **ON**, causing continuous evaporator (indoor) fan operation or set to **AUTO** causing fan operation to coincide with heating or cooling run cycles. Continuous fan mode during cooling operation may not be appropriate in humid climates. If the indoor air exceeds 60% relative humidity or simply feels uncomfortably humid, it is recommended that the fan only be used in the **AUTO** mode. With the thermostat set to **ON** current is supplied to the control transformer (on 460v models the outdoor fan relay (ODF) is energized through normally closed contacts on the defrost control (DFC).

### COOLING MODE

#### Thermostat call for cooling (2-stage thermostat)

##### Call for 1<sup>st</sup> stage cooling only:

With the room thermostat set to **COOL** and the fan set to **AUTO**, power is supplied from the room thermostat "O" terminal to the unit switchover valve coil (SOV) and the "O" terminal on the ECMC board. This energizes the switch-over valve (SOV) placing it in the position for cooling (it is in the position for heating when de-energized). On a call for cooling, power is supplied to the unit from the room thermostat (Y1) and (G) terminal. (Y1) provides power to the compressor contactor (CC), the defrost control (DFC) and the electronically commutated motor control (ECMC). (G) provides power to the (ECMC) for low speed (IDM) indoor fan motor operation.

The energized compressor contactor (CC) completes the circuit to the compressor for 1<sup>st</sup> stage (Low) operation and the outdoor single speed fan motor (ODM). The (G) signal energizes the (ECMC) for the indoor fan motor (ECM) to operate on low speed. The thermostat will continue to cycle the compressor and fans to maintain the desired temperature.

##### Call for 2<sup>nd</sup> stage after 1st stage

On a call for 2nd stage cooling, power is supplied from the room thermostat (Y2) terminal to the A/C rectifier (ACR) and the (ECMC). This energizes the (ACR) switching the compressor to 2<sup>nd</sup> stage (High) operation. The (ECMC) is energized for indoor fan motor (ECM) high speed fan operation. The room thermostat will continue to cycle the system between 1<sup>st</sup> and 2<sup>nd</sup> stage to maintain the desired temperature.

### HEATING MODE

#### Thermostat call for heat (2-stage thermostat)

##### Call for 1<sup>st</sup> stage heating only:

With the room thermostat set to **HEAT** and the fan set to **AUTO**, no power is supplied from the room thermostat "O" terminal to the unit switchover valve coil (SOV) and the "O" terminal on the ECMC board. This leaves the switch-over valve (SOV) in the normal position for heating and is the signal for the (ECMC) to run at indoor fan speeds designed for heating. On a call for heating, power is supplied to the unit from the room thermostat (Y1) and (G) terminal. (Y1) provides power to the compressor contactor (CC), the defrost control (DFC) and the electronically commutated motor control (ECMC). (G) provides power to the (ECMC) for low speed (ECM) indoor fan motor operation.

The energized compressor contactor (CC) completes the circuit to the compressor for 1<sup>st</sup> stage (Low) operation and the outdoor single speed fan motor (ODM). The indoor fan motor (ECM) will operate on low speed. The room thermostat will continue to cycle the compressor and fans to maintain the desired temperature.

##### Call for 2<sup>nd</sup> stage after 1st stage

On a call for 2nd stage heating, power is supplied from the room thermostat (Y2) terminal to the compressor rectifier (ACR) and the (ECMC). This energizes the (ACR) switching the compressor to 2<sup>nd</sup> stage (High) operation. The (ECMC) is energized for indoor fan motor (ECM) high speed fan operation. The room thermostat will continue to cycle the system between 1<sup>st</sup> and 2<sup>nd</sup> stage to maintain the desired temperature.

### Supplementary Heat

The supplementary electric heat is brought on when the indoor temperature drops below the thermostat setting. The thermostat provides power from the "W" terminal to the supplementary heater control circuit. Note that the fan relay (F) must have been energized. An outdoor thermostat may have been added to disallow the second stage (if provided) of electric heat above a selected outdoor temperature. If the outdoor temperature falls below the setting on the outdoor thermostat, this additional heater stage will come on. When the outdoor air temperature rises, and the outdoor T-stat setpoint is reached, the system will revert back to first stage electric heating.

When the indoor ambient is satisfied, "W" contacts will open and the unit will revert back to the compressor only heating mode and then off. For emergency heat (use of supplementary electric heat only), an emergency (EMERG) heat switch is provided within the thermostat. When placed in the emergency heat position, it will disable the compressor, bypass the outdoor thermostats, if provided, and engage the supplementary electric heaters and indoor fan.

### Demand Defrost Operation

During the heating cycle, the outdoor coil may require a defrost cycle which is determined by the demand defrost control (DFC). This control continuously measures the outdoor coil temperature (CBS) and the outdoor ambient temperature (ODS-B) and calculates the difference or delta-T measurement. When the calculated delta-T is met, the demand defrost control (DFC) opens the circuit to the outdoor fan motor (ODM) and energizes the switch-over valve (SOV), placing the unit in the cooling mode to defrost the outdoor coil (on SCROLL bearing units only, the control will stop the compressor for a minimum of thirty (30) seconds). The outdoor coil temperature sensor (CBS) terminates the defrost cycle, or it times off after twelve (12) minutes in defrost, the (DFC) energizes the outdoor fan motor (ODM) and twelve seconds later de-energizes the (SOV), which returns the unit to the heating mode. Supplementary electric heat, if provided, is brought on to control indoor temperature during the defrost cycle. During this defrost cycle the indoor fan will run at the speed designated for 2nd stage cooling.

### Defrost Control

The demand defrost control measures heat pump outdoor ambient temperature with a sensor located outside the outdoor coil. A second sensor located on the outdoor coil is used to measure the coil temperature. The difference between the ambient and the colder coil temperature is the difference or delta-T measurement. This delta-T measurement is representative of the operating state and relative capacity of the heat pump system. Measuring the change in delta-T determines the need for defrost. The coil sensor also senses outdoor coil temperature for termination of the defrost cycle.

# Installer's Guide

## ECM Fan Motor Adjustments

If the airflow needs to be increased or decreased, see the Airflow Table in the SERVICE FACTS. Information on changing the speed of the blower motor is in the Blower Performance Table. Blower speed changes are made on the ECM Fan Control mounted in the control box. The ECM Fan Control controls the variable speed motor. There is a bank of 8 dip switches, (See Figure 19 below), located on the board. The dip switches work in pairs to match the cooling/heat pump airflow (CFM/TON), Fan off-delay options and electric heat airflow adjustment. The unit ships with dip switches defaulted as shown below.

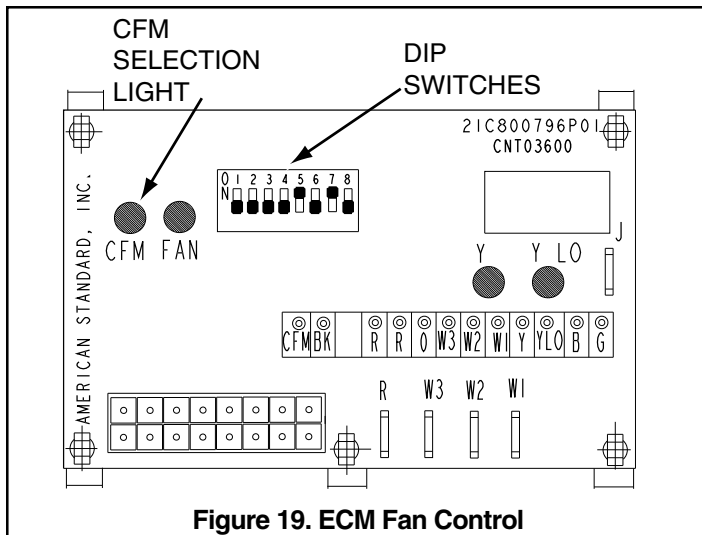


Figure 19. ECM Fan Control

## Final Installation Checklist

- ☐ Does the unit run and operate as described in the section on Sequence of Operation, page 19, in response to the room thermostat?
- ☐ Are the condenser fan and indoor blower operating correctly with proper rotation and without undue noise?
- ☐ Is the compressor operating correctly and has the system been checked with a charging chart?
- ☐ Has the voltage and running current been checked to determine if it is within limits?
- ☐ Has the thermostat been checked for calibration and the air discharge grills adjusted to balance the system?
- ☐ Has the ductwork been checked for air leaks and condensation?
- ☐ Has the furnace manifold pressure been checked and adjusted if necessary?
- ☐ Has the heating air temperature rise been checked?
- ☐ Has the unit been checked for tubing and sheet metal rattles? Are there any other unusual noises to be checked?
- ☐ Are all covers and panels in place and properly fastened?
- ☐ Has the owner been instructed on the proper operation and maintenance of the unit? Be sure to leave this manual with the owner.

## Maintenance

### Owner Maintenance

Some of the periodic maintenance functions of the 4WCZ6 unit can be performed by the owner; this includes replacing the disposable or cleaning the permanent air filters, cleaning the unit cabinet, cleaning the condenser coil, and conducting a general unit inspection on a regular basis.

### Filters

**When the system is in constant operation**, inspect the filters at least once each month.

If the unit has disposable-type filters, replace them with new filters of the same type and size. **Do not attempt to clean disposable filters.**

Permanent-type filters can be cleaned by washing them with a mild detergent and water. Make sure that the filters are thoroughly dry before reinstalling them in the unit (or duct system).

**NOTE:** It may be necessary to replace permanent filters annually if washing fails to clean the filter or if the filter shows signs of deterioration. Be sure to use the same type and size as was originally installed.

### Condenser Coil

Be sure to keep all vegetation and debris away from the condenser coil area.

## Service Maintenance

### Cooling Season

To keep the unit operating safely and efficiently, the manufacturer recommends that a qualified service technician check the entire system at least once each season or sooner if needed. The service technician should examine these areas of the 4WCZ6 unit:

- filters (for cleaning or replacement)
- motors and drive system components (for proper operation)
- economizer gaskets (for possible replacement)
- safety controls (for mechanical cleaning)
- electrical components and wiring (for possible replacement and connection tightness)
- condensate drain (for proper sealing and cleaning)
- unit duct connections (to see that they are physically sound and sealed to the unit casing)
- unit mounting support (for structural integrity)
- the unit (for obvious unit deterioration)

### Heating Season

Complete the following unit inspections and service routines at the beginning of each heating season.

- Visually inspect the unit to ensure that the airflow required for combustion and condenser coil is not obstructed from the unit.
- Inspect the control panel wiring to verify that all electrical connections are tight and that the wire insulation is intact.

## **Limited Warranty High Efficiency Heat Pump 4WCZ6, 4WCY4, 2/4WCX3 and WCZ**

(Parts Only)

### **Models Less Than 20 Tons for Residential Use\***

This limited warranty is extended by Trane U.S. Inc., to the original purchaser and to any succeeding owner of the real property to which the Heat Pump is originally affixed, and applies to products purchased and retained for use within the U.S.A. and Canada.

If any part of your Heat Pump fails because of a manufacturing defect within five years from the date of the original purchase, Warrantor will furnish without charge the required replacement part. Any local transportation, related service labor, diagnosis calls, refrigerant and related items are not included.

In addition, if the sealed motor-compressor(s) fail(s) or the outdoor coil<sup>†</sup> should become defective, either or both events occurring because of a manufacturing defect within the sixth through tenth year from the date of original purchase, Warrantor will furnish without charge the required replacement compressor and/or outdoor coil. Any local transportation, related service labor, diagnosis calls, refrigerant and related items are not included.

<sup>†</sup>NOTE: If your Heat Pump is installed within one mile of salt water, including but not limited to seacoasts and inland waterways, your outdoor coil warranty as stated above is limited to five years from the date of original purchase.

This limited warranty does not cover failure of your Heat Pump if it is damaged while in your possession, damage caused by unreasonable use of the Heat Pump and/or damage from **failure to properly maintain** the Heat Pump as set forth in the Use and Care manual (**see Proper Maintenance section**).

**THE LIMITED WARRANTY AND LIABILITY SET FORTH HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, WHETHER IN CONTRACT OR IN NEGLIGENCE, EXPRESS OR IMPLIED, IN LAW OR IN FACT, INCLUDING BUT NOT SPECIFICALLY LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR USE, AND IN NO EVENT SHALL WARRANTOR BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

Some states do not allow limitations on how long an implied limited warranty lasts or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Parts will be provided by our factory organization through an authorized service organization in your area listed in the yellow pages. If you wish further help or information concerning this limited warranty, contact:

Trane  
P. O. Box 9010, Tyler, TX 75711-9010  
Attention: Manager, Field Operations Excellence

Or visit our website: [www.trane.com/residential](http://www.trane.com/residential)

TW-1003-4707

\* This limited warranty is for residential usage of this equipment and not applicable when this equipment is used for a commercial application. A commercial use is any application where the end purchaser uses the product for other than personal, family or household purposes.

## **Limited Warranty High Efficiency Heat Pump 4WCZ6, 4WCY4, 2/4WCC3, 2/4WCX3, WCZ, WCD, WCH, WCK, WSC (Parts Only)**

### **Models Less Than 20 Tons for Commercial Use\***

This warranty is extended by Trane U.S. Inc., to the original purchaser and to any succeeding owner of the real property to which the Heat Pump is originally affixed, and applies to products purchased and retained for use within the U.S.A. and Canada. There is no warranty against corrosion, erosion or deterioration.

If any part of your Heat Pump fails because of a manufacturing defect within one year from the date of the original purchase, Warrantor will furnish without charge the required replacement part.

In addition, if the sealed motor-compressor fails because of a manufacturing defect within the second through fifth year from the date of original purchase, Warrantor will furnish without charge the required replacement compressor. Warrantor's obligations and liabilities under this warranty are limited to furnishing F.O.B. Warrantor factory or warehouse replacement parts for Warrantor's products covered under this warranty. Warrantor shall not be obligated to pay for the cost of lost refrigerant. No liability shall attach to Warrantor until products have been paid for and then liability shall be limited solely to the purchase price of the equipment under warranty shown to be defective.

**THE WARRANTY AND LIABILITY SET FORTH HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, WHETHER IN CONTRACT OR IN NEGLIGENCE, EXPRESS OR IMPLIED, IN LAW OR IN FACT, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR USE, AND IN NO EVENT SHALL WARRANTOR BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

Some states do not allow limitations on how long an implied warranty lasts or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Trane  
P.O. Box 9010  
Tyler, TX 75711-9010  
Attention: Manager, Field Operations Excellence

TW-1005-4707

\* This warranty is for commercial usage of said equipment and not applicable when the equipment is used for a residential application. Commercial use is any application where the end purchaser uses the product for other than personal, family or household purposes.



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The manufacturer has a policy of continuous product and product data improvement, and it reserves the right to change design and specification without notice.